



U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE

INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT  
(Use several sheets if necessary)

(PTO-1449)

ATTY. DOCKET NO.  
GCS41-4-C1

SERIAL NO.  
10/629,976

APPLICANT  
Bott et al.

FILING DATE  
July 30, 2003

GROUP ART UNIT  
Unassigned

REFERENCE DESIGNATION		U.S. PATENT DOCUMENTS					
EXAM'R INITIAL	DOCUMENT NUMBER	DATE	NAME	Class	Subclass	Filing Date If Appropriate	
P1	A1 *5,403,737	04/04/95	Abrahmsen et al.				
	A2 *5,629,173	05/13/97	Abrahmsen et al.				
	A3 *5,316,935	05/31/94	Arnold et al.				
	A4 *5,208,158	05/04/93	Bech et al.				
	A5 *5,244,791	09/14/93	Estell				
	A6 *5,316,941	05/31/94	Estell et al.				
	A7 *5,955,340	02/21/99	Bott				
CH	A8 *5,340,735	08/23/94	Christiansen et al.				

FOREIGN PATENT DOCUMENTS

EXAM'R INITIAL	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	Subclass	TRANSLAT'N
P1	B1 *EP 3 328 229 A1	08/16/89	EP			
	B2 *WO 00/01712	01/13/00	PCT			
	B3 *WO 91/16423	04/18/91	PCT			
	B4 *WO 96/27671	02/27/96	PCT			
	B5 *WO 97/37007	10/09/97	PCT			
	B6 *WO 98/23732	06/04/98	PCT			
	B7 *WO 99/20723	04/29/99	PCT			
	B8 *WO 99/37323	07/29/99	PCT			
M1	B9 *WO 99/37324	07/29/99	PCT			

OTHER DOCUMENTS (including Author, Title, Date, Pertinent Pages, Etc.)

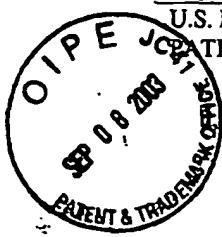
M1	C1	*Bech et al., "Chemical Modifications of a Cysteinyl Residue Introduced in the Binding Site of Carboxypeptidase Y by Site-Directed Mutagenesis," <i>Carlsberg Res. Commun.</i> , 53:381-393 (1988)
	C2	*Bech et al., "Significance of Hydrophobic S <sub>4</sub> -P <sub>4</sub> Interactions in Subtilisin 309 from <i>Bacillus lentinus</i> ," <i>Biochemistry</i> , 32:2847-2852 (1993)
	C3	*Berglund et al., "Altering the Specificity of Subtilisin <i>B. lentinus</i> by Combining Site-Directed Mutagenesis and Chemical Modification," <i>Bioorganic &amp; Mechanical Chemistry Letters</i> , 6:2507-2512 (1996)
M1	C4	*Berglund et al., "Chemical Modification of Cysteine Mutants of Subtilisin <i>Bacillus lentinus</i> Can Create Better Catalysts Than The Wild-Type Enzyme," <i>J. Am. Chem. Soc.</i> , 119:5265-5266 (1997)

EXAMINER

DATE CONSIDERED

1/6/06

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant(s).



U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE

INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT  
(Use several sheets if necessary)

(PTO-1449)

ATTY. DOCKET NO.  
GC541-4-C1

SERIAL NO.  
10/629,976

APPLICANT  
Bott et al.

FILING DATE  
July 30, 2003

GROUP ART UNIT  
Unassigned

OTHER DOCUMENTS (including Author, Title, Date, Pertinent Pages, Etc.)

1	C5	*Betzel et al., "Crystal Structure of the Alkaline Proteinase Savinase™ from <i>Bacillus lenthus</i> at 1.4 Å Resolution," <i>J. Mol. Biol.</i> , 223:427-445(1992)
	C6	*Bonneau et al., "Alteration of the Specificity of Subtilisin BPN' by Site-Directed Mutagenesis in its S <sub>1</sub> and S <sub>1'</sub> Binding Sites," <i>J. Am. Chem. Soc.</i> , 113:1026-30 (1991)
	C7	*Brocklehurst, "Specific Covalent Modification of Thiols: Applications in the Study of Enzymes and Other Biomolecules," <i>Int. J. Biochem.</i> , 10:259-274 (1979)
	C8	*Bruice et al., "Novel Alkyl Alkanethiolsulfonate Sulfhydryl Reagents. Modification of Derivatives of L-Cysteine," <i>Journal of Protein Chemistry</i> , 1:47-58 (1982)
	C9	*Chen et al., "Probing the S-1' Subsite Selectivity of an Industrial Alkaline Protease in Anhydrous t-Butanol," <i>Bioorganic &amp; Medicinal Chemistry Letters</i> , 3(4):727-33 (1993)
	C10	*Davies et al., "A Semisynthetic Metalloenzyme Based on a Protein Cavity That Catalyzes the Enantioselective Hydrolysis of Ester and Amide Substrates," <i>J. Am. Chem. Soc.</i> , 119:11643-11652 (1997)
	C11	*Davis, B.G., et al., "Altering the specificity of subtilisin <i>Bacillus lenthus</i> through the introduction of positive charge at single amino acid sites," <i>Bioorganic and Medicinal Chemistry</i> , (1999 Nov.) 7 (11) 2303-11, XPO000892841
	C12	*Davis, B.G., et al., "Controlled site selective protein glycosylation for precise glycan structure catalytic activity relationships," <i>Biorganic &amp; Medicinal Chemistry</i> , Vol. 8, 2000, pp. 1527-1535
	C13	*Davis, B.G., et al., "Glycomethanethiosulfonates: powerful reagents for protein glycosylation," <i>Tetrahedron: Asymmetry</i> , NL, Elsevier Science Publishers, Amsterdam, Vol 11, No. 1, January 2000 (2000-01), pp. 245-262
	C14	*Davis, B.G., et al., "The controlled introduction of multiple negative charge at single amino acid sites in subtilisin <i>bacillus lenthus</i> ," <i>Bioorganic and Medicinal Chemistry</i> , (1999 Nov.) 7 (11) 2293-301, XPO000892840
	C15	Davis, B.G., et al., "Glycosyldisulfides: a new class of solution and solid phase glycosyl donors," <i>Chem. Commun.</i> , 2001, pp.189-190
	C16	*Davis, Benjamin G, et al., "Controlled Site Selective Glycosylation of Proteins by a Combined Site Directed Mutagenesis and Chemical Modification Approach," <i>J. Org. Chem.</i> , Vol. 63, January 12, 1998 (1998-01-12), pp. 9614-9615
	C17	*Davis, Benjamin G, et al., "The Controlled Glycosylation of a Protein with a Bivalent Glycan: Towards a New Class of Glycoconjugates, Glycodendriproteins," <i>Chem. Commun.</i> , 2001, pp. 351-352
	C18	*DeSantis et al., "Chemical Modifications at a Single Site Can Induce Significant Shifts in the pH Profiles of a Serine Protease," <i>J. Am. Chem. Soc.</i> , 120:8582-8586 (1998)
2	C19	*Desantis, G., et al., "Probing the altered specificity and catalytic properties of mutant subtilisin chemically modified at position S156C and S166C in the S1 pocket," <i>Bioorganic and Medicinal Chemistry</i> , (1997) 7/7 (1381-1387), XPO000892843

EXAMINER

DATE CONSIDERED 11/1/06

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant(s).



U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE

INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT  
(Use several sheets if necessary)

(PTO-1449)

ATTY. DOCKET NO.  
GC541-4-C1

SERIAL NO.  
10/629,976

APPLICANT  
Bott et al.

FILING DATE  
July 30, 2003

GROUP ART UNIT  
Unassigned

OTHER DOCUMENTS (including Author, Title, Date, Pertinent Pages, Etc.)

M	C20	*DeSantis, G., et al., "Site-Directed Mutagenesis Combined with Chemical Modification As a Strategy for Altering the Specificity of the S1 and S1' Pockets of Subtilisin Bacillus Lentus," <i>Biochemistry</i> (1998) 37 (17) 5968-73
	C21	*Dickman, M., et al., "Chemically modified mutants of subtilisin bacillus lentus catalyze transesterification reactions better than wild type," <i>Tetrahedron Asymmetry</i> , (11. Dec. 1998) 9/23 4099-4102, XPO000901276.
	C22	*Gron et al., "A Highly Active and Oxidation-Resistant Subtilisin-Like Enzyme Produced by a Combination of Site-Directed Mutagenesis and Chemical Modification," <i>Eur. J. Biochem.</i> , 194:897-901 (1990)
	C23	*Kaiser, "Catalytic Activity of Enzymes Altered at Their Active Sites," <i>Agnew. Chem. Int. Ed. Engl.</i> , 27:913-922 (1988)
	C24	*Kawase et al., "Effect of Chemical Modification of Tyrosine Residues on Activities of Bacterial Lipase," <i>Journal of Fermentation and Bioengineering</i> , 72:317-319 (1991)
	C25	*Kenyon et al., "Novel Sulfhydryl Reagents," <i>Methods Enzymol.</i> , 47:407-430 (1977)
	C26	*Kluger et al., "Amino Group Reactions of the Sulfhydryl Reagent Methyl Methanesulfonothioate. Inactivation of D-3-hydroxybutyrate Dehydrogenase and Reaction with Amines in Water," <i>Can. J. Biochem.</i> , 58:629-632 (1980)
	C27	*Lloyd, R.C. et al., "Site Selective Glycosylation of Subtilisin Bacillus Lentus Causes Dramatic Increase in Esterase Activity," <i>Biorganic &amp; Medicinal Chemistry</i> , Vol. 8, 2000, pp. 1537-1544
	C28	*Lo, Bryan, et al., "Replacement of Ala-166 with Cysteine in the High Affinity Rabbit Sodium Glucose Transporter Alters Transport Kinetics and Allows Methanethiosulfonate Ethylamine to Inhibit Transporter Function," <i>The Journal of Biological Chemistry</i> , 273:2 903-909 (1998)
	C29	*Neet, K.E. and Koshland, D.E., "The Conversion of Serine at the Active Site of Subtilisin to Cysteine: A 'Chemical Mutation,'" <i>Proc. Nat. Acad. Sci. USA</i> , 56(5):1606-1611.
	C30	*Nishimura et al., "Reversible Modification of the Sulfhydryl Groups of <i>Escherichia coli</i> Succinic Thiokinase with Methanethiolating Reagents, 5,5'-Dithio-bis(2-Nitrobenzoic Acid), p-Hydroxymercuribenzoate, and Ethylmercurithiosalicylate," <i>Archives of Biochemistry and Biophysics</i> , 170:461-467 (1975)
	C31	*Paulson, J.C., "Glycoproteins: what are the sugar chains for?" <i>TIBS</i> , 14:272-276 (1989)
	C32	*Planas et al., "Reengineering the Catalytic Lysine of Aspartate Aminotransferase by Chemical Elaboration of a Genetically Introduced Cysteine," <i>Biochemistry</i> , 30:8268-8276 (1991)
	C33	*Plettner, E., et al., "Modulation of Esterase and Amidase Activity of Subtilisin Bacillus Lentus by Chemical Modification of Cysteine Mutants," <i>Journal of the American Chemical Society</i> , (2 Jun. 1999) 121/21, 4977-4981, XPO000891274.
M	C34	*Plettner, Erika et al., "A Combination Approach to Chemical Modification of Subtilisin Bacillus Lentus," <i>Biorganic &amp; Medicinal Chemistry Letters</i> (Sept. 8, 1998) Vol. 8, No. 17, pp. 2291-2296, XP0004138220

EXAMINER

DATE CONSIDERED

1/6/06

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant(s).



U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE

INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT  
(Use several sheets if necessary)

(PTO-1449)

ATTY. DOCKET NO.  
GC541-4-C1

SERIAL NO.  
10/629,976

APPLICANT  
Bott et al.

FILING DATE  
July 30, 2003

GROUP ART UNIT  
Unassigned

OTHER DOCUMENTS (including Author, Title, Date, Pertinent Pages, Etc.)

C35	*Polgar et al., "A New Enzyme Containing a Synthetically Formed Active Site. Thiol-Subtilisin," <u>Journal of American Chemical Society</u> , 88:3153-3154 (1966)
C36	Rademacher et al., "Glycobiology,"
C37	*Ramachandran et al., "Stabilization of Barstar by Chemical Modification of the Buried Cysteines," <u>Biochemistry</u> , 35:8776-8785 (1996)
C38	*Roberts et al., "Reactivity of Small Thiolate Anions and Cysteine-25 in Papain Toward Methyl Methanethiosulfonate," <u>Biochemistry</u> , 25:5595-5601 (1986)
C39	*Siddiqui et al., "Arthrobacter D-Xylose Isomerase: Chemical Modification of Carboxy Groups and Protein Engineering Of pH Optimum," <u>Biochem. J.</u> , 295:685-691 (1993)
C40	*Smith et al., "An Engineered Change in Substrate Specificity of Ribulosebisphosphate Carboxylase/Oxygenase," <u>The Journal of Biological Chemistry</u> , 265:1243-1245 (1990)
C41	*Smith et al., "Chemical Modification of Active Site Residues in $\gamma$ -Glutamyl Transpeptidase," <u>The Journal of Biological Chemistry</u> , 270:12476-12480 (1995)
C42	*Smith et al., "Restoration of Activity to Catalytically Deficient Mutants of Ribulosebisphosphate Carboxylase/Oxygenase by Aminoethylation," <u>The Journal of Biological Chemistry</u> , 263:4921-4925 (1988)
C43	*Smith et al., "Simple Alkanethiol Groups for Temporary Blocking of Sulphydryl Groups of Enzymes," <u>Biochemistry</u> , 14:766-771 (1975)
C44	*Smith et al., "Subtle Alteration of the Active Site of Ribulose Bisphosphate Carboxylase/Oxygenase by Concerted Site-Directed Mutagenesis and Chemical Modification," <u>Biochemical and Biophysical Research Communications</u> , 152:579-584 (1988)
C45	*Spura, A., et al. "Probing Agonist Domain of the Nicotinic Acetylcholine Receptor by Cysteine Scanning Mutogenesis Reveals Residues in Proximity to the Alpha-Bungarotoxin Binding Site," <u>Biochemistry</u> , 20 Apr. 1999 Vol. 38:16 pp. 4912-4921
C46	*Stewart et al., "Catalytic Oxidation of Dithiols by a Semisynthetic Enzyme," <u>J. Am. Chem. Soc.</u> , 108:3480-3483 (1986)
C47	*Valenzuela et al., "Kinetic Properties of Succinylated and Ethylenediamine-Amidated $\delta$ -Chymotrypsins," <u>Biochim. Biophys. Acta</u> , 250:538-548 (1971)
C48	*West et al., "Enzyme-catalysed Synthesis of Peptides Containing D-Amino Acids, <u>J. Chem. Soc. Chem. Commun.</u> , pp 417-18 (1986)
C49	*West et al., "Enzymes as Synthetic Catalysts: Mechanistic and Active-Site Considerations of Natural and Modified Chymotrypsin," <u>J. Am. Chem. Soc.</u> , 112:5313-5320 (1990)
C50	*White et al., "Sequential Site-Directed Mutagenesis and Chemical Modification to Convert the Active Site Arginine 292 Of Aspartate Aminotransferase to Homoarginine," <u>Journal of the American Chemical Society</u> , 114:292-293 (1992)
C51	*Wynn et al., "Chemical Modification of Protein Thiols: Formation of Mixed Disulfides," <u>Methods in Enzymology</u> , 251:351-356 (1995)

EXAMINER

DATE CONSIDERED

11/6/06

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant(s).



U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE

INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT  
(Use several sheets if necessary)

(PTO-1449)

ATTY. DOCKET NO.  
GC541-4-C1

SERIAL NO.  
10/629,976

APPLICANT  
Bott et al.

FILING DATE  
July 30, 2003

GROUP ART UNIT  
Unassigned

OTHER DOCUMENTS (including Author, Title, Date, Pertinent Pages, Etc.)

M	C52	*Wynn et al., "Comparison of Straight Chain and Cyclic Unnatural Amino Acids Embedded in the Core of Staphylococcal Nuclease," <i>Protein Science</i> , 6:1621-1626 (1997)
M	C53	*Wynn et al., "Mobile Unnatural Amino Acid Side Chains in the Core of Staphylococcal Nuclease," <i>Protein Science</i> , 5:1026-1031 (1996)
M	C54	*Wynn et al., "Unnatural Amino Acid Packing Mutants of <i>Escherichia Coli</i> Thioredoxin Produced by Combined Mutagenesis/Chemical Modification Techniques," <i>Protein Science</i> , 2:395-403 (1993)

EXAMINER

DATE CONSIDERED

11/6/06

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant(s).